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Institutions, Opportunism and Prosocial Behavior: Some Experimental Evidence

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Comments

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Abstract: Formal or informal institutions have long been adopted by societies to protect against opportunistic behavior. However, we know very little about how these institutions are chosen and their impact on behavior. We experimentally investigate the demand for different levels of institutions that provide low to high levels of insurance and its subsequent impact on prosocial behavior. We conduct a large-scale online experiment where we add the possibility of purchasing insurance to safeguard against low reciprocity to the standard trust game. We compare two different mechanisms, the private (purchase) and the social (voting) choice of institutions. Whether voted or purchased, we find that there is demand for institutions in low trustworthiness groups, while high trustworthiness groups always demand lower levels of institutions. Lower levels of institutions are demanded when those who can benefit from opportunistic behavior, i.e. low trustworthiness individuals, can also vote for them. Importantly, the presence of insurance crowds out civic spirit even when subjects can choose the no insurance option: trustworthiness when formal institutions are available is lower than in their absence.

Keywords: institutions; trust; trustworthiness; voting; insurance

JEL classification: C92, D02, D64.

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1. Introduction

Humans invest in social relationships in the hope of future gains in the social or economic domain, but due to their very nature such interactions implicitly rely on trust. That is, future benefits clearly depend on others' behavior. Trust relations of these kinds form the foundation of social and economic interactions. To quote Arrow (1972, p.357): "Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a certain period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence".

How this "mutual lack of confidence" negatively impacts economic transactions is illustrated with the following example. Suppose that an investor may trust an investee hoping that a later action by her may make the investment profitable. The investee can default (on her action) thus making the investment unprofitable. This possibility could induce the investor not to invest, thus harming both parties. To avoid the risk of default, some costly action can be put in place. Society has responded by developing institutions precisely to prevent this type of opportunistic behavior and minimize the loss of profitable exchanges. Certifying agencies, enforcers, public notaries, courts, police forces, are all examples of (costly) institutions put in place by society to help avoid the risk of default on such promises. Setting up such institutions is costly, and they are second-best solutions at best, as social welfare would be larger if there were no defaults.

Our aim is to understand the causes and consequences of institutions chosen by individuals and societies to protect themselves against opportunistic behaviors of others. We focus on whether lack of trustworthiness affects the choice of these institutions. Institutions are costly for society and provide insurance against default. Due to its costs, setting up a higher level of institutions implies a lower social welfare overall. We pay special attention to the role of mechanisms, private or social, adopted to choose such institutions. Keeping this goal in mind, we set up institutions that can be purchased or voted upon. In terms of consequences, we focus on the impact of the presence of institutions on individual pro-sociality.

There is already some research on the relation between trust and regulation which we discuss in the literature review. But the likely co-determination of trust and regulation implies that there are serious difficulties in clearly establishing causality with field data. Further, pro-

social motives may be an important determinant of trust and consequently institutions, and those motives are hard to measure in the field. It is for this reason that we turn to experiments.

We conduct a large-scale online experiment using M-Turk. The first part of the experiment involves a modified version of the standard trust game (Berg, Dickhaut, & McCabe, 1995) which is used to determine the level of trust and trustworthiness of participants. Given their decisions, individuals, are then subsequently allocated to a low-, or high-, trustworthiness group. In the second part, individuals get to choose between various levels of insurance which protect them against future opportunistic behavior. Insurance is costly and ensures that at least some of the money sent will be returned to the sender. Higher levels of insurance, i.e. higher guaranteed returned amounts, are costlier. The cost of higher insurance is reflected in the reduced rents from exchange, thus decreasing the returns from investment.

Keeping the first part the same, we introduce two treatment variations in the second part which allows us to study different mechanisms used to build institutions. In the first, the *purchase* treatment, senders individually decide amongst four possible insurance levels (with 'no insurance' also being one of the options). In the second, the *voting* treatment, all players in the group vote for their preferred insurance level. The most voted insurance level is then implemented for the group. The two treatments are designed to mimic the role of (costly) (insurance) institutions as a substitute for trust, and to study their subsequent impact on trustworthiness**.**

We now briefly summarize the main results. First, there is a significant demand for insurance in both treatments and this depends on the level of trustworthiness of the group (known by the individuals). When *purchased*, individuals in the low trustworthiness group demand more insurance than those in the high trustworthiness group. When *voted* upon, the demand for insurance is the same in both groups. This is quite an intriguing result that is explained by strategic behavior on behalf of the (low trustworthiness) individuals. This difference is explained by the manner in which institution levels are chosen. In the purchase treatment the institution (level) is chosen by the sender, whereas in the voting treatment both senders and receivers vote for the level of the institution. This is important, as voting upon an institution can have its consequences in that untrustworthy individuals can vote strategically to take advantage of future interactions by voting for a low level of insurance.

We conduct an additional treatment where only senders can vote for the level of institutions. In this treatment, senders in the low trustworthiness groups vote for higher levels of institutions which supports the hypothesis of strategic voting.

Second, for the same levels of trustworthiness the behavior of receivers is similar across treatments. Those in the low trustworthiness group increase the amount returned as the level of institutions increases (i.e. greater insurance). This result seems to be driven by the higher minima imposed by the insurance contracts. However, those in the high trustworthiness group return less as the level (of institutions) increases, showing that the presence of institutions in high trustworthiness settings crowds out reciprocity.

Finally, we find that the level of trustworthiness in the first part of the experiment is higher than in the second. This suggests that the mere possibility of choosing/voting for institutions can crowd out civic behavior. However, this result could be due to several changes between the first and the second parts of the experiment. First, in the second part the participants are assigned and then informed about the group to which they belong. Second, insurance options are introduced after individuals have made their decisions in the first part of the experiment. Third, the level of insurance in the second part is chosen/voted by other players. In order to analyze which of these three reasons explain the results, we conduct another series of experiments that allow us to understand which of the three mechanisms plays a role in determining our results.

We introduce four additional treatments. In a first *additional* treatment, the players were divided into groups, and the receiver had the same set of choices as in the first part. The only innovation between the first and the second part was that participants knew whether they were in a high or a low-trustworthiness group. The second *additional* treatment introduced different levels of insurance, but the level was chosen by nature and not by the group members. The third and fourth *additional* treatments were similar to the *insurance contracts* and *voting* treatments. However, we added the possibility for the sender not to send anything and avoid opportunistic behavior by avoiding exposure.

We still observe crowding out, i.e. having the possibility of choosing institutions significantly increases the difference in the amount returned between the first and second part of the experiment for the high trustworthiness group. With these additional treatments we

can show that the crowding out effect we observe has to do with the presence of institutions and is not an outcome of the fact that the institutions are chosen or voted upon. Being informed (that they are in the low or high trustworthiness group), also seems to affect the amount returned in the second part, but the effect of the ability to choose institutions is larger. Importantly, the presence of institutions, or the release of information about the group they are in, does not result in any significant difference for the low trustworthiness group.

Results in our paper are consistent with the fact that more trustworthy societies demand less institutions and are more efficient (see Pinotti, 2012; Aghion, Algan, & Cahuc, 2011), we observe higher gains from exchange in higher trustworthiness groups than in lower trustworthiness ones. From a policy perspective, one important lesson is that protection against opportunism cannot be the exclusive remit of the public sector. Voters will be concerned about the times when they are the opportunists themselves. The second big message from this perspective is that institutions against opportunism can crowd out part of the civic spirit that sustains cooperation, so when initiated, they should be sufficiently robust so that the situation does not end up being worse than without them.

The structure of the rest of the paper is as follows. Section 2 discusses some related literature. Section 3 is devoted to the experimental design. Section 4 proposes a theoretical framework. Section 5 reports the results. Section 6 concludes.

2. Related literature

Trust has been defined in a variety of ways, but a common element (see e.g. Doney, Cannon, & Mullen, 1998) is the disposition of individuals (or collective decision makers) to be placed in a situation where others can take advantage of them, *in the expectation* that such a situation leads instead to mutual benefit. Trust is often beneficial: Knack and Keefer (1997) show a strong relationship between trust and economic growth. Trust ensures that investments can be protected using a set of non-legally binding agreements on a set of rules (see Greif, 1993 with regard to Mahgrebi traders), or the use of social networks in ancient Indian Ocean trade (see e.g. Ghosh, 1993; Sealand, 2013). Trust has also been positively associated with better public education (Galor & Zeira, 1993; Putnam, Leonardi, & Nanetti, 1993; La Porta et al., 1997), the organizations of firms (Fukuyama, 1995; La Porta et al., 1997; Bertrand & Schoar, 2006), the labor market (Algan & Cahuc, 2009, Aghion et al.,

2011), public service (Putnam, Leonardi, & Nanetti, 1993), regulation (Aghion et al., 2011), financial outcomes (Guiso, Sapienza, & Zingales, 2004, 2008, 2009), insurance (Cole et al., 2013) and research and development (Akcomak & ter Weel, 2009).

After the correlational work of Knack & Keefer (1997), a growing literature has analyzed the causality path between trust and economic growth. For example, Tabellini (2010) analyzes the effect of culture on economic performance using regional data from 8 European countries. Culture is measured by individual values and beliefs such as trust, respect for others or confidence in the link between effort and economic success. To avoid reverse causality, Tabellini (2010) uses past literacy rates and restraints on executive power as instruments for contemporaneous trust. He finds that regions with higher levels of trust present significantly higher income per capita and higher growth rates. Algan & Cahuc (2010) follow a different strategy. They use a time-varying instruments for contemporaneous trust: inherited trust of immigrants. In order to exclude reverse causality, they use the trust of immigrants inherited from their home countries as a proxy for contemporaneous trust, assuming that their level of trust is gradually modified by their country of residence. They find a substantial impact of inherited trust on changes in income per capita.

Two closely related papers are Aghion et al. (2010) and Pinotti (2012). Aghion et al. (2011) propose a theoretical model where they show that lack of trust increases the demand for regulation. They also provide correlational survey evidence linking trust levels in various countries with support for regulation. Using data from several countries, Pinotti (2012) argues that differences in regulation reflects concern for market failures and shows that the variation in entry regulations around the world mostly reflect demand pressures from individuals at large, as captured by differences in trust. We add to this literature by providing controlled experiments where causality can be more tightly established. And, more importantly, we add by showing that the method by which the demand is expressed, individual, or collective through voting, can lead to different amounts of insurance.

Although we focus on the relationship from culture to the demand for institutions[1], Lowes et al. (2017) offer evidence of the other direction of causality: centralized formal institutions

[1] Alesina & Giuliano (2015) survey the theoretical and empirical literature on the relationship between culture and institutions.

are associated with weaker norms of rule-following and a greater propensity to cheat for material gain. This could be connected to our result that the mere existence of insurance against opportunism decreases the trustworthiness of the more trustworthy individuals.

Bénabou & Tirole (2006) theoretically, and Cárdenas, Stranlund, & Willis (2000), Falk & Kosfeld (2006) experimentally, pioneered the study of how incentives may crowd out prosocial behaviour. They find that the participants behave more selfishly when the principal becomes more controlling. Bohnet & Beytelman (2007) find that control affects trust but not trustworthiness. In contrast, we find that the existence of institutions, even if they do not constrain participants, is enough to affect trustworthiness. We also contribute to this literature by adding that the level of trust in the environment matters for the crowding out.

3. Experimental Design

3.1 The game

The experiments were run on M-Turk. The experimental design consisted of two parts. Our design is motivated by our research question, i.e. the impact of trust and trustworthiness on the choice of institutions. In the first, subjects participated in a variation of the trust game (Berg, Dickhaut, & McCabe, 1995) where player A had to decide whether to invest her entire initial endowment of 100 points or not. If she chose to invest, the endowment was tripled to 300. The other player, B, decided how to split the 300 points received from player A. She could choose to return any integer amount between 0 and 300 and keep the rest for herself (in addition to her initial endowment). We used the strategy method (Selten, 1967) and asked subjects to make decisions on both roles simultaneously. A binary decision for player A was chosen to simplify the decision problem and obtain a unique measure of trustworthiness.

In the second part, individuals were classified according to their level of trustworthiness in the first part, i.e., the amount they (as Player B) returned to player A in the first part of the game. Individuals who returned 150 points[2] or more in the first part of the experiment were classified as having *high* trustworthiness, whereas individuals who returned less than 150 points were classified as having *low* trustworthiness. Individuals in each category were then

[2] The average amount returned in the first part was 155, very close to 150.

randomly matched in groups of four and were informed whether they were in a low or high trustworthiness group. All participants were also informed about the selection criteria.

In the second part, subjects then made decisions in another variation of the trust game (see Table 1) where Player S had to select amongst four different investment options (S1, S2, S3 and S4). Each option guaranteed (different levels of) a minimum amount returned by player R. We interpret these investment options as a choice between different levels of institutions. For example, S1 represented the lowest level of institutions, where Player R would have the option to return to Player S anything between 0 and 300. The lowest level of institutions provided no insurance. While, S4 represents a situation in which Player S has the maximum coverage (as her earnings are between 100 and 150) and hence provided the highest level of insurance. Note that, higher levels of insurance (moving from S1 to S4) imply lower overall theoretical surplus. For example, S1 (or no insurance) generated 300 points to be distributed by player R, whereas S4 generated only 150 points. This game can be interpreted as a standard trust game in which the sender's investment is reduced by the cost of the insurance. Lower overall surplus at higher levels of insurance reflects the costs for setting up such institutions.

Table 1. Trust game in Part II.

Players' decision		Payoffs	
Player S: **selected option:**	Player R: **amount allocated to player S:**	Player S's payoff	Player R's payoff
S1	$X \in [0,300]$	X	$400 - X$
S2	$X \in [25,270]$	X	$370 - X$
S3	$X \in [65,210]$	X	$310 - X$
S4	$X \in [100,150]$	X	$250 - X$

3.2 Treatments

We conducted three main treatments, *Purchase* (n=214), *All-Voting* (n=207), and *S-Voting* (n=320), in which we modified how the different institutions (S1 to S4) were selected. All experimental procedures were approved by the ethics committee at Middlesex University. We describe the three main treatments below.

Purchase treatment. In this treatment, player S chose from one of the four possible levels, S1 to S4, of institutions.

All-Voting treatment. In this treatment, players first had to vote in groups of four regarding the institution level they preferred. In particular, subjects were presented with all possible pairs of insurance levels in random order and had to decide which one they preferred for each pair.

S-Voting treatment. This treatment is identical to the *All-Voting* treatment except that only the vote of players S would count for choosing the insurance level. In order to be able to compare the results with the voting treatment, we formed groups of 8 subjects in which 4 of them would be randomly selected as players S and the remaining four players would be players R.

Clearly, the All-Voting treatment is more realistic than the S-Voting one. As we will see, there is a significant difference in demand for insurance between Purchase and All-Voting. We conjectured that the main reason is that participants in All-Voting anticipate that they will be Receivers (player R) with 50% probability and will be negatively affected by the protection. Hence, we introduced S-Voting as an artificial treatment that allows to directly test the conjecture that being both senders and receivers reduces the demand for insurance.

In the voting treatments, we used an extension of Condorcet's voting rule proposed by (Young, 1986, 1988, 1995; Young & Levenglick, 1978) to select the most preferred insurance level in each group. This mechanism has been shown to be incentive-compatible and difficult to manipulate (Harrison & McDaniel, 2008).[3]

We also conducted a series of additional treatments which allowed us to better analyze subject behavior, the mechanisms behind our results, and to disentangle possible confounds.

No Investment+Purchase treatment (*NI+Purchase*). In this treatment player S had the option "not to invest" or select one of the four insurance levels (S1, S2, S3, S4). The "not to invest" option guaranteed 100 points to both players S and R.

No investment+S-Voting treatment (*NI+S-Voting*). In this treatment player S had the option whether to invest under the insurance levels (S1, S2, S3, S4) voted by the group or to

[3] Harrison & McDaniel (2008) argue that (sic) *"it is a natural and intuitive extension of the idea of simple majority rule, to allow for the possibility of Condorcet cycles forming. These cycles are avoided by searching over all non-cyclic group rankings to find the one receiving greatest support in terms of pairwise comparisons."* They refer to this as the 'Condorcet-Consistent' voting rule.

opt out, i.e. "not to invest". The decision whether to invest or not was presented after the voting decision.

Repeated trust treatment (*Repeated*). In this treatment, player S had only two options, either insurance level S1 or "not to invest".

Random insurance level treatment (*Random*). In this treatment, player S had the option "not to invest". If she did not choose this option then one insurance level from (S1, S2, S3, S4) was randomly chosen by the computer.

All these treatments only differ from the previous treatments in one dimension of the second part of the modified trust game. The *NI+Purchase* and *NI+S-Voting* treatments are identical to the *Purchase* and *S-Voting* treatments except that they include the *No Investment* option which allows Player S to opt out and not invest in the second part of the game. Under this option both players S and R obtain 100 points. Note that, "not to invest" is dominated by S4 which guarantees 100 points to both players and 50 additional points to be distributed by player R. The *Random* treatment has the same levels of institutions as the *NI+Purchase* treatment, the only difference being that the one implemented is determined by a random computer draw. In the *Repeated* treatment, the first, and second part, subgames are identical. The only difference is that in the second part participants know that they belong to high or low trustworthiness groups and are matched with somebody in their own group.

3.3 Procedures

We conducted our experiments on the Amazon Mechanical Turk online platform. A total of 1564 subjects (52% female; Age, M=38.46, SD=11.61) participated and the task took approximately 20 minutes to complete.

Subjects were informed that the experiment would consist of a series of decision tasks divided into three parts and that their earnings in each part would be determined separately. The first two parts corresponded to the trust game described in section 3.1. In the third part of the experiment, subjects undertook a series of tasks measuring their risk attitudes a la Holt & Laury (2002), distributional social preferences (Bartling et al., 2009; Corgnet, Espín, & Hernán-González, 2015), numeracy (Schwartz et al., 1997; Cokely et al., 2012), cognitive reflection test (Frederick, 2005; Toplak, West, & Stanovich, 2014) and some socio-

demographic. Instructions (see Appendix A) were distributed at the beginning of each part describing only the task in that part. No feedback was provided at any time during the experiment.

Table 2. Descriptive statistics by treatments and balance tests.

Treatment	Female	Age	Attended college	Finished College
Purchase (n=214)	56.54%	38.42	79.91%	52.34%
	(49.69%)	(11.61)	(40.16%)	(50.06%)
S-Voting (n=320)	45.94%	37.33	81.88%	50.94%
	(49.91%)	(11.77)	(38.58%)	(50.07%)
All-Voting (n=207)	48.31%	37.98	79.23%	52.17%
	(50.09%)	(11.76)	(40.67%)	(50.07%)
Repeated (n=200)	51.50%	39.06	84.00%	55.50%
	(50.10%)	(11.21)	(36.75%)	(49.82%)
NI+Random (n=204)	53.43%	39.37	90.69%	64.22%
	(50.00%)	(11.81)	(29.13%)	(48.05%)
NI+Purchase (n=208)	51.92%	39.32	82.21%	56.25%
	(50.08%)	(11.70)	(38.33%)	(49.73%)
NI+Voting (n=211)	59.72%	38.44	86.73%	58.77%
	(49.16%)	(11.29)	(34.01%)	(49.34%)
Total (n=1564)	52.05%	38.47	83.38%	55.37%
	(49.97%)	(11.61)	(37.24%)	(49.73%)

Balance tests: joint test of orthogonality (p-values, using the variables above)	
Purchase vs. All-Voting	0.1295
Purchase vs. S-Voting	0.5524
NI+Purchase vs. NI+S-Voting	0.2275
NI+Purchase vs. Random	0.9724
NI+Purchase vs. Repeated	0.3780

Note: the mean is reported and the standard deviation between parentheses.

In approximately 20 minutes, subject payment varies between a minimum of $0.01 and a maximum of $8.87, and on average subjects earned $2.43 plus a fixed payment of $0.90. Earnings were presented in points and converted to dollars according to the exchange rate of 100 points = $1. At the end of the experiment, subjects were randomly matched and assigned roles that determined their payments.

In Table 2 we show summary statistics by treatment for baseline characteristics we elicited prior to the online experiment. Balance tests using a join test of orthogonality on all these baseline characteristics also indicate that assignment to different treatments can be considered random.

4. A model to rationalize choices in the experiment

We now construct a model to organize our conjectures about choices in the experiment. From previous existing data of behaviors in trust games, the model should account for the fact that a majority of individuals return money as receivers, so they need to have distributional preferences. In addition, the model needs to be able to accommodate the fact that in two identical situations from material and distributive points of view (Part 1 of the experiment vs. Part 2: with level of insurance 1), receivers could behave differently. One model that can accommodate both needs is the one in Charness & Rabin (2002). Denoting x_i the monetary payoff of individual i, her utility v_i can be written as,

$$v_i = x_i - (\alpha_i - \theta_i \phi_j)\, max\{x_j - x_i, 0\} - (\beta_i + \theta_i \phi_j)\, max\{x_i - x_j, 0\}$$

In this model, the parameter α_i is the baseline sensitivity of *i* towards *j* if she has higher payoff than herself. β_i is the baseline sensitivity of *i* towards *j* if she has lower payoff than herself. Then, $\theta_i \phi_j$ modifies the baseline taking into account the attitude of *i* towards *j* based on *j*`s actions, which is why this is important in our experiment. We have that $\phi_j = -1$ if *j* "misbehaved", and $\phi_j = 1$, if she did not. That is, if player *j* "misbehaved", player i increases her "envy" parameter α (or decreases her "guilt" parameter β) by a number equal to θ. In other words, both envy and guilt are modulated (softened or increased) as a function of how the "other" behaved previously.

We use risk neutral preferences, since in many trust games risk aversion seems to make no difference in choices (Eckel & Wilson, 2004). This is important because it means we will attribute the differences in choices only to beliefs and heterogeneity in $\beta_i, \theta_i, \phi_j$.

Sender behavior

To rationalize the choice of senders, we will not resort to social preferences, as it will make the analysis unnecessarily complicated and is not really needed. In the case of senders, the key determinant for their choices is to know how expectations will change under the

different treatments/environments. The optimal choice of contract in this case is the one yielding highest expected monetary payoff. Formally, denoting by S_i^* the optimal contract choice of player *i* belonging to group G_i, where G_L is the low trustworthiness group and G_H is the high trustworthiness group.

$$S_i^* = max_{j\in 1,2,3,4} E\left(x\middle|s_j, G_i\right)$$

We hypothesize that

Assumption 1.

$$E(x|s_1, G_L) - E(x|s_4, G_L) < E(x|s_1, G_H) - E(x|s_4, G_H)$$

that is, senders expect lower payoff difference without protection relative to full protection in group L than in group H. Of course, with heterogeneous beliefs between individuals it can still be that payoff is expected to be larger under s_1 or s_4. Nevertheless, from assumption 1 it is immediate that:

Observation 1.

$$Pr(S_i^* = s_1|G_L) < Pr(S_i^* = s_1|G_H),$$

$$Pr(S_i^* = s_4|G_L) > Pr(S_i^* = s_4|G_H)$$

that is, the fraction of senders choosing institution s_1 will be lower in $G_L$than in G_H, and the opposite is true for s_4. From Table 1, adding the payoff of sender and receiver, one can see that the surplus of the pair is always lower from higher level of institutions. From Observation 1 for every sender-receiver couple *i*, *j* we can then immediately obtain the following observation:

Observation 2.

$$E\left(x_i + x_j\middle|G_L\right) < E\left(x_i + x_j\middle|G_H\right)$$

that is, G_H groups choose on average lower levels of institutions and that is automatically associated with a higher aggregate payoff for the pair.

Receiver behavior

Receivers have no uncertainty about the action taken by senders, so the only determinant of their choices is their social preferences and their beliefs about what is the socially

appropriate action. We expect, from behavior in previous trust games, that very few senders will get a higher material payoff than receivers (Johnson & Mislin, 2011), so that the part of the function related to α_i (spite) will not be important for the results. In addition, it is immediate from our assumption about the utility function of participants that:

Observation 3.

For given values of θ_i and ϕ_j, the level of x_i returned by player j is increasing in β_i That is, individuals with a higher level of compassion return more and variations in the level of spite are not relevant for the results.

However, it is more difficult to establish the effect on receivers of the existence of contracts. In order to see this, if we denote by x_i the amount returned by the receiver, we first observe:

Observation 4.

$$E(x_i|s_1) \neq E(x_i|Part_1) \text{ implies that } \theta_i \neq 0$$

This is true since for the receiver the two situations ($s_1$and $Part_1$) are equivalent from the point of view of material and distributional preferences. That is, for a given x_i, the outcome in terms of the amount of money she obtains and the sender obtains are the same for $s_1$and for $Part_1$, so if θ_i were equal to zero, she should make the same choice in both situations, and thus it must be that $\theta_i \neq 0$. But going beyond this observation is hard, as the amount returned will depend on whether and how the presence of insurance changes θ_i. Nevertheless, the following observation provides some guidance about what to expect.

Observation 5.

If the presence of insurance increases θ_i (say because it signals a social norm to return), then $E(x_i|s_1) < E(x_i|Part_1)$. If the presence of insurance decreases θ_i (say because it allows for a dilution of responsibility), then $E(x_i|s_1) > E(x_i|Part_1)$.

5. Results

5.1 First part: Is there a need for institutions?

We report the decisions of individuals A (trust) and B (trustworthiness) in the first part of the experiment in Table 2. We observe that around 50% of them decided to trust their initial

endowment to A. Pairwise comparisons using proportion tests show that A's behavior in this part is similar across all treatments (Purchase vs All-Voting, p=0.2116; Purchase vs S-Voting, p=0.8324; All-Voting vs S-Voting, p=0.1157).[4] More importantly for our analysis, the behavior of B´s is also not different across treatments (Mann-Whitney-Wilcox test, MWW hereafter; p=0.8587, p=0.8591, p=0.9921).

Table 3. Trust and Trustworthiness in Part 1.

		Purchase	All-Voting	S-Voting
Trust	% choose A1	50.93%	57.00%	50.00%
Trustworthiness	Average	155.62	153.92	155.20
	Median	200.00	200.00	200.00
	Std. Dev.	70.17	72.86	71.71
	N	214	207	320

We get a clear separation between the low-, and high-, trustworthiness groups. The average amount returned in the low-trustworthiness group (M=47.88, SD=49.35) was significantly lower than in the high-trust-worthiness group (M=193.74, SD=20.53; MMW p<0.0001; pairwise comparisons *all p's<0.0001*). Interestingly, trust is also lower in the low-(21.32%), than the high, -trustworthiness group (63.42%; proportion test, p<0.0001). This clearly shows that across all treatments those exhibiting high trustworthiness also display higher levels of trust relative to low trustworthiness individuals.

In the low trustworthiness group, nearly 60% of the subjects make the trustor worse off by returning less than 100, while nearly 48% returned zero. By construction, subjects in the high trustworthiness group returned more than 150 points (79.6% of those in the high trustworthiness returned exactly 200) and consequently trustors associated with them were always better off.

5.2. Second part: Institutions.

In the second part participants decide on the level of institutions they prefer. They could either directly purchase the level of institutions or vote upon it. Our choice of the institutions (Table 1) is based on the idea that putting them in place is second best from the welfare standpoint. Setting up institutions is costly and the greater is the insurance provided, the higher is the cost of setting them up. This is reflected in the decrease in total surplus as the

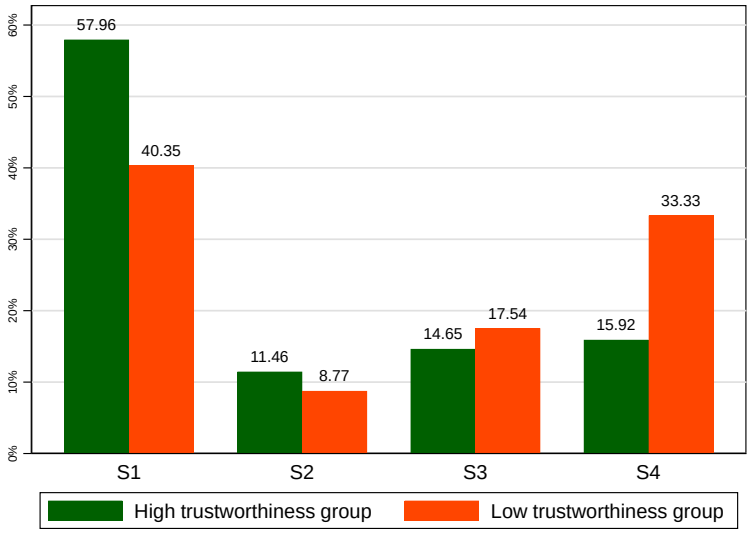
[4] Using Bonferroni's correction, the p-value threshold for significance at the 10% (5%) level is equal to 0.0333 (0.01667), in case we consider the 3 pairwise comparisons as independent tests.

minimum guaranteed amount returned to the trustor increases (from 0 for S1 to 100 for S4). In fact, total available surplus is maximized (=300) with S1 that provides zero insurance to the trustor and decreases subsequently as the level of the insurance for the trustor (sender) increases with a total available surplus of 250 for S4. S1, in effect captures informal social contracts that are at the very heart of trust dealings. While, higher levels of institutions, from S2 to S4, reflect the price one pays for securing institutions that provide insurance. That is, the higher the security, the greater is the cost to society. While, S1 shows full trust towards the receiver (and zero institutions per se), S4 exhibits minimal trust and 100% security for the trustor.

5.2.1. Purchase treatment: S chooses the level of institutions

In the purchase treatment, all S´s select the level of the institution they desire by choosing from one of the four possible insurance levels. In order to analyze the demand for institutions we restrict the sample to the purchase treatment and analyze how the choice of institutions varies according to whether individuals are in a high or a low trustworthiness group.

Figure 1. Choice of Institutions (Purchase treatment)



As the cost of insurance increases with the level of institutions, the expected earnings of individuals in the high trustworthiness group are higher than for those individuals in the low trustworthiness one. This is also consistent with Observation 2 in our theoretical framework.

5.2.2 Voting treatment: Player S votes for the level of institutions

Figure 1 shows that the majority of individuals (57.96%) in the high trustworthiness group demand the lowest level of institution S1 (i.e. least insurance). Meanwhile, in the low trustworthiness group, the lowest level of institution (S1) is demanded by 40.35%, with 33.33% choosing the maximum level of insurance (S4). A Kolmogorov-Smirnov test and a Fisher exact test show that the distributions by group are different (*p=0.0636 and p=0.0315*, respectively). Thus, individuals' level of trustworthiness seems to affect the choice of institutions, with low trustworthiness individuals being more likely to choose a higher level of institutions (resulting in higher insurance). This is consistent with our theoretical Observation 1 in Section 4.

In the purchase treatment, institutions are chosen by individuals by paying a price for increased levels of insurance. While a price may be implicit in the choice of institutions in certain situations, institutions are also voted for by citizens (or selected by elected politicians, who are supposed to represent electoral preferences).

We ran two treatments here, the S-Voting and All-Voting treatments. In the S-Voting treatment only players S could vote for the institution while in All-Voting both players S and R voted. Players in both treatments were presented with all possible pairs of insurance levels in random order and had to decide which one they preferred for each pair. Then we apply the Condorcet's voting rule proposed (Young, 1986, 1988, 1995; Young & Levenglick, 1978) to select the institution for each group.

First, we analyze the results from the S-Voting treatment, where players S vote in groups of 4 for the level of institutions they prefer. Out of the times they are presented with a particular choice we compute the fraction of times subjects vote for institutions S1, S2, S3, and S4 in pairwise comparisons. We then analyze differences across groups for these proportions. Results are reported in Table 4 (first three columns). We find that the fraction of times those in the high trustworthiness group vote for the lowest level of institution (S1) is significantly higher than that for the low trustworthiness group (proportion test, *p=0.0016*). The opposite is true for the highest level of institutions (S4) that provides most insurance (p=0.0001). This is qualitatively similar to what we observe in Figure 1 and also is consistent with our theoretical Observations 1 and 2 in Section 4.

Now we analyze results from the All-Voting treatment (Table 4, last three columns) where individuals vote in groups of 4 before knowing if they will be participating as senders or receivers. Our motivation for running this treatment is to see whether strategic voting is observed when one can vote without knowing what role, player R or S, they will be in later on. Results show that there are no differences across groups, and both groups prefer institutions S1. We observe that the fraction of votes received declines as the level of institutions increases. This is not consistent with our theoretical Observation 1 in Section 4. We analyze this unexpected result in the following section.

Table 4. Fraction of time subjects voted for one option (with respect to another one) by High and Low trustworthiness groups.

Mean (std dev) Level of institutions	S-Voting			All-Voting		
	High	Low	p^+	High	Low	p^+
S1	0.569 (0.424)	0.397 (0.428)	0.0016	0.724 (0.407)	0.780 (0. 388)	0.3768
S2	0.571 (0.248)	0.520 (0.245)	0.1071	0.578 (0.217)	0.613 (0.177)	0.2845
S3	0.499 (0.256)	0.516 (0.216)	0.5813	0.442 (0.202)	0.393 (0.169)	0.1102
S4	0.362 (0.406)	0.567 (0.429)	0.0001	0.256 (0.395)	0.214 (0.378)	0.4951

+ This column corresponds to the p-values of a t-test comparing the High and Low trustworthiness groups.

5.2.3. Comparison across the three treatments:

Here we compare the choice of institutions between individuals across the three treatments. We create a dummy variable for *high insurance* which takes value one if S3 or S4 are selected, and zero otherwise, in the purchase treatment. In the treatments where players S vote for the level of institutions, the high insurance variable takes value one if options S3 or S4 are always selected by the individuals when presented in pairs against another option. Therefore, this dummy indicates whether the individual strongly prefer institutions S3 or S4, i.e. a fairly high level of insurance.

In Table 5 we run a linear probability model[5] with the *high insurance* dummy as a dependent variable. In the first two columns we see that the treatments where players S chose

[5] Results from a probit regression are very similar and available on request.

the level of institutions, or voted for it, are very similar and subjects remain equally likely to demand high institutions (after controlling for individual demographics, risk aversion, envy, CRT and numeracy tests, etc.). In contrast, when players vote for the level of institutions, and this also affects them as player R, they select lower levels of institutions. When we divide the sample into the low and high trustworthiness groups, we see that these differences come from those who returned less and are also robust to the inclusion of all these controls. This shows that low trustworthiness individuals are more likely to vote strategically.

Table 5. Linear regressions on the choice of high insurance (S3 or S4 vs S1 or S2)

	All individuals		High trustworthiness group		Low trustworthiness group	
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.3598***	0.4627***	0.3057***	0.5218***	0.5088***	0.2651
	(0.0329)	(0.1384)	(0.0369)	(0.1776)	(0.0668)	(0.2822)
S-Voting	0.0572	0.0328	0.0446	-0.0066	0.0769	0.1303
	(0.0455)	(0.0475)	(0.0515)	(0.0540)	(0.0894)	(0.0957)
All-Voting	-0.1303***	-0.1078**	-0.0557	-0.0428	-0.3323***	-0.2376***
	(0.0453)	(0.0472)	(0.0528)	(0.0544)	(0.0858)	(0.0885)
Risk aversion		-0.0014		0.0001		-0.0098
		(0.0095)		(0.0114)		(0.0181)
Envy		0.0791***		0.0756***		0.0612
		(0.0201)		(0.0220)		(0.0517)
Compassion		-0.0731***		-0.0808***		-0.0294
		(0.0214)		(0.0276)		(0.0528)
CRT		0.0173		0.0152		0.0190
		(0.0123)		(0.0138)		(0.0271)
Numeracy		-0.0166		-0.0416**		0.0477
		(0.0153)		(0.0179)		(0.0307)
Female		0.0067		-0.0209		0.1349
		(0.0393)		(0.0450)		(0.0819)
Age		-0.0008		0.0001		-0.0037
		(0.0017)		(0.0019)		(0.0035)
Attended college		0.0197		0.0194		0.0045
		(0.0599)		(0.0696)		(0.1246)
Finished college		-0.0291		-0.0529		0.0826
		(0.0446)		(0.0519)		(0.0885)
Trust unknown individuals		0.0041		-0.0011		0.0451
		(0.0194)		(0.0226)		(0.0380)
Expected trustworthiness		0.0002		0.0003		-0.0005
(first part)		(0.0005)		(0.0006)		(0.0010)
Sent in the first part		-0.2034***		-0.1607***		-0.3686***
		(0.0449)		(0.0545)		(0.0784)
Observations	644	564	466	409	178	155
R2	0.0259	0.1440	0.0077	0.1304	0.1205	0.2701

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As predicted in Observation 1, we find that in the high trustworthiness group most individuals choose S1. Meanwhile, for the low trustworthiness group there is a sizeable percentage of individuals choosing S4. However, many still choose S1. The differences

observed in the All-Voting treatment may, however, be due to players' strategic behavior. In this case, players voted for the level of institutions without knowing what role, S or R, they will be playing later on. From the point of view of player R, S1 is always preferable, given that it will maximize payments if they decide to return nothing (or a small amount). From the point of view of player S, their choice may be different depending on what group they are in. For the high trustworthiness group, players S would maximize payments choosing S1 if they expect the other players in their group would return, as in part 1, an amount equal to or higher than 150. However, players S in the low trustworthiness group would choose S4 if they expect the other players in their group to return less than 150, as in part 1. This could explain why the level of institutions chosen by the low trustworthiness group differs across treatments.

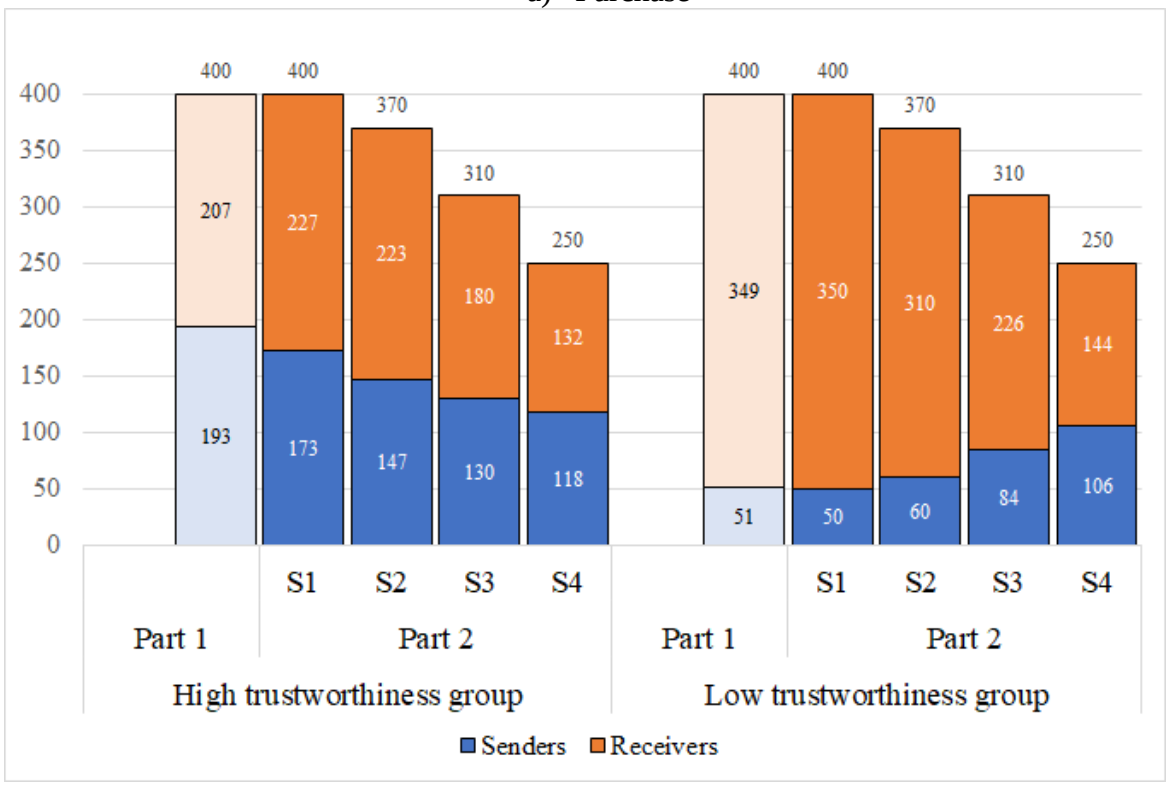
5.3. Return Behavior.

Does return behavior change between the purchase and the voting treatments? Here we analyze this by level of institutions and group. Figure 2 shows the average payments for players S and R in the first and second part of the experiment by treatment and group. First, we find that the average pattern is practically identical across treatments (there are only minor differences among panels a), b), and c) in Figure 2). Second, we observe that the total amount of payments decreases with the level of institutions, as implemented in the experimental design (400 for S1, 370 for S2, 310 for S3, and 250 for S4). Third, we find strong differences in how the rents are distributed between player S and R, depending on which group they are in. In the high trustworthiness group, players S get around 43.2% (between 39.7% and 47.7%) of the rents generated, whereas in the low trustworthiness group, player S obtain only 24.0% (between 12.1% and 42.4%) of the rents. Interestingly, the effect of institutions also differs between groups. In the high trustworthiness group, players S' earnings decrease with the level of institutions. This result seems consistent with the results of Falk & Kosfeld (2006) if players R perceive higher institutions as a signal of distrust. However, in our setting the total rents decrease with the level of institutions but the relative amount sent back by recipients remained stable across the different levels of institutions, as mentioned above. In the low trustworthiness group, the pattern is the opposite. Players S' earnings, increase with the level of institutions. This is the case as players R are forced to increase the amount returned with the higher minima determined by each level of insurance. In the low trustworthiness group,

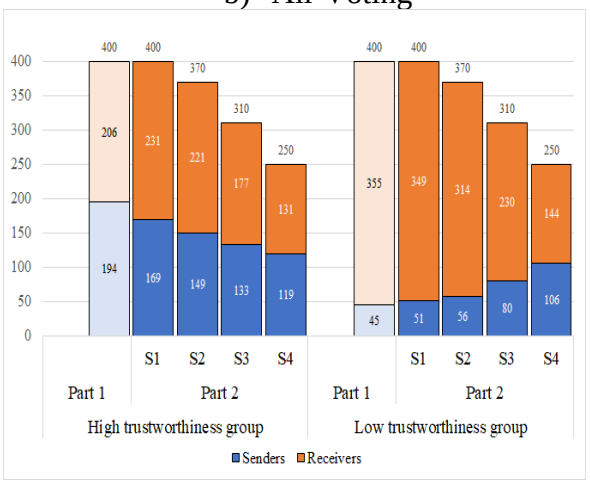
51.27% (51.78%) [57.87%] {70.56%} returned the minimum amount of 0 (25) [65] {100} under S1 (S2) [S3] {S4}, whereas these proportions were significantly lower in the high trustworthiness group 2.94% (2.94%) [3.68%] {25.00%} (proportion tests, all p's<0.0001).

Figure 2: Payments by Treatment and Group

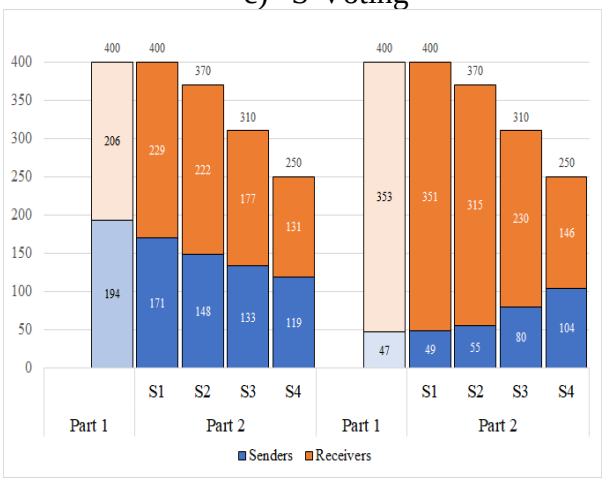
a) Purchase



b) All-Voting



c) S-Voting



The regression analysis reported in Table 6 confirm these results. The first four columns of Table 6 show that for each level of institution (S1-S4), the amount returned is significantly

higher in the high trustworthiness groups, whereas there are no significant differences across treatments. However, differences between the high and low trustworthiness groups decrease with the level of institutions. We also find that the main observable predictor of the amount returned is the level of compassion (β_i) of the participant, consistent with the theory informing our Observation 3 in Section 4.

Table 6. Linear regressions on the amount returned by level of insurance and the difference between amounts returned in the first and second parts (S1) of the experiment.

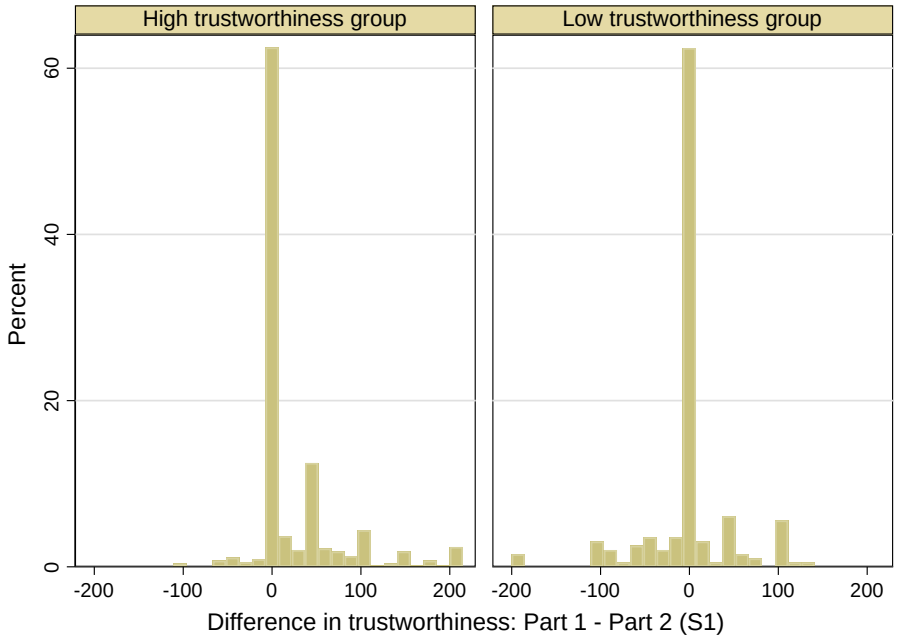
	(1) S1	(2) S2	(3) S3	(4) S4	(5) Part 1 – S1
Constant	-13588	8038	61.757***	103.087***	32.107**
	-16589	-13004	-8610	-3562	-16036
S-Voting	4.216	0.560	-0.963	-1.126	-0.557
	(10.519)	(8.188)	(5.146)	(1.936)	(9.539)
All-Voting	0.079	-5.215	-5.089	-0.997	1.129
	(11.319)	(8.534)	(5.212)	(2.050)	(9.272)
High trustworthiness group	95.489***	62.729***	34.766***	8.233***	37.738***
	(10.579)	(8.769)	(5.770)	(2.346)	(9.432)
S-Voting x	-4.350	2.431	4.293	-0.337	-0.238
High trustworthiness group	(11.599)	(9.256)	(6.024)	(2.418)	(10.575)
All-Voting x	-5.572	5.861	7.747	1.908	5.068
High trustworthiness group	(12.673)	(9.814)	(6.200)	(2.550)	(10.638)
Risk aversion	-1.483	-0.684	-0.405	-0.167	1.834**
	(1.025)	(0.798)	(0.524)	(0.236)	(0.880)
Envy	-0.148	-0.736	0.561	-0.315	0.964
	(2.127)	(1.790)	(1.220)	(0.543)	(2.000)
Compassion	19.991***	17.702***	9.937***	2.898***	-14.034***
	(3.178)	(2.515)	(1.567)	(0.655)	(2.790)
CRT	0.043	0.235	-0.096	-0.243	-0.952
	(1.442)	(1.083)	(0.743)	(0.325)	(1.304)
Numeracy	2.819*	2.828**	0.240	-0.333	-2.265
	(1.693)	(1.349)	(0.941)	(0.413)	(1.610)
Female	1.518	-0.330	-1.599	-0.185	2.981
	(4.099)	(3.347)	(2.222)	(0.987)	(3.722)
Age	0.306*	0.172	-0.002	-0.001	-0.341**
	(0.182)	(0.128)	(0.093)	(0.044)	(0.172)
Attended college	-4.344	-3.446	1.166	0.047	0.835
	(6.118)	(5.071)	(3.289)	(1.481)	(5.887)
Finished college	3.961	1.755	-2.015	-0.872	-3.327
	(4.360)	(3.584)	(2.505)	(1.121)	(3.791)
Trust unknown individuals	3.300	3.052*	2.136*	0.136	-1.044
	-2140	-1730	-1151	(0.518)	-1851
Expected trustworthiness (first part)	0.107*	0.060	0.024	0.020	0.013
	(0.062)	(0.047)	(0.030)	(0.013)	(0.056)
Sent in the first part	13.371**	10.929**	4706	1565	-6981
	-5295	-4322	-2897	-1264	-4973
Observations	637	637	637	637	637
R2	0.6105	0.5703	0.4886	0.2496	0.1284

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In the second part, when the level of institutions is S1, there is effectively no protection as R can always return 0 to player S. This situation is therefore the same as the one in the first part of the game. This allows us to compare the stability of an individuals' level of trustworthiness (see first two bars, Part 1 and S1 in Part 2, in Figure 2). In order to do this, we calculate the difference in the amounts returned in the first part of the game and, under S1 in the second part. If the difference is positive, this means that the amount returned in the second part is smaller than the amount returned in the first. In the last column of Table 6 we report the results of a regression of the difference in trustworthiness between the first and second part (S1).

Overall, we do not observe differences across treatments. However, we find a significant positive effect for the high trustworthiness group. This implies that the introduction of institutions makes those in the high trustworthiness group less likely to return an amount as high as the one returned in the first part. Introducing the possibility of choosing institutions seems to crowd out civic behavior differentially for the high trustworthiness group, and this is robust to controlling for risk aversion and social preferences.

Figure 3: Difference in the amount returned in the purchase and voting treatments between the first and second (S1) parts by group.



Finally, note that from the viewpoint of the receiver, the environments in Part 1 and Part 2 under S1 are identical, in a material and distributional way. That is, for a given amount returned by the receiver, the outcome in terms of the amount of money she obtains and the sender obtains are the same in Part 1 and Part 2 under S1. Hence, from our Observation 4 in the theory Section 4, we know that $\theta_i \neq 0$, meaning that players change their sense of "deservingness" of return behavior in the presence of institutions. The fact that there is a decrease means, in accordance with Observation 5 in Section 4, that the presence of institutions decreases θ_i, perhaps because it allows for a dilution of responsibility. Figure 3 shows the differences in trustworthiness between the first and second part of the experiment for the three treatments. One can see that those in the high trustworthiness group are *more likely* to display positive differences than those in the low trustworthiness one. A Kolmogorov-Smirnov test confirms that the two distributions are different *(p-value = 0.0003)*. We investigate this result further in the next section.

5.4 Crowding-Out of pro-sociality.

In the previous section we saw that individuals in the high trustworthiness group return significantly less in the second, than in the first, part of the experiment. This difference arises even when the lowest level of institutions is chosen (where there is no protection and the amounts that can be returned are the same in the first and the second part). We postulate that this could be due to the fact that we allow the participants to select the level of institutions they prefer that subsequently crowds-out civic spirit.

To understand this further, it will be useful to look at the changes in the experimental design between the first and second stages. This is important as we compare the level of trustworthiness of the individuals between these two stages to establish crowding out. We see that besides the introduction of institutions in the second part there are three changes that could possibly confound the results. The changes are as follows. *First*, in the second part senders did not have the option not to send anything (i.e. to opt out). *Second*, we inform subjects they belong to either the low or high trustworthiness group. *Third*, in the second part participants know that the level of institutions is either chosen or voted by other players. The result earlier mentioned could have arisen due to any one of these factors.

Now we explore whether any of these factors could be driving the crowding out result. We do this by using the additional treatments where they had the option "not to invest" in the second part. In order to understand whether the knowledge of being in the high trustworthiness group also has an additional effect on our results, we restrict our sample to the *Repeated* treatment where individuals play the same game in both parts, with the only difference being that in the second part they have information about the group they are in.

Table 7. Trustworthiness by treatment for the high trustworthiness group.

Treatment	Part 1	S_1 in Part 2	Difference (%)	Paired t-test p-value
Repeated	197.93	183.14	-6.78%	0.0003
	(29.45)	(46.04)	(22.03%)	
NI+Purchase	193.53	175.99	-16.78%	<0.0001
	(23.18)	(50.18)	(28.82%)	
NI+Voting	197.81	168.33	-9.06%	<0.0001
	(24.87)	(48.62)	(24.44%)	
NI+Random	193.37	161.18	-13.73%	<0.0001
	(29.52)	(59.79)	(25.06%)	

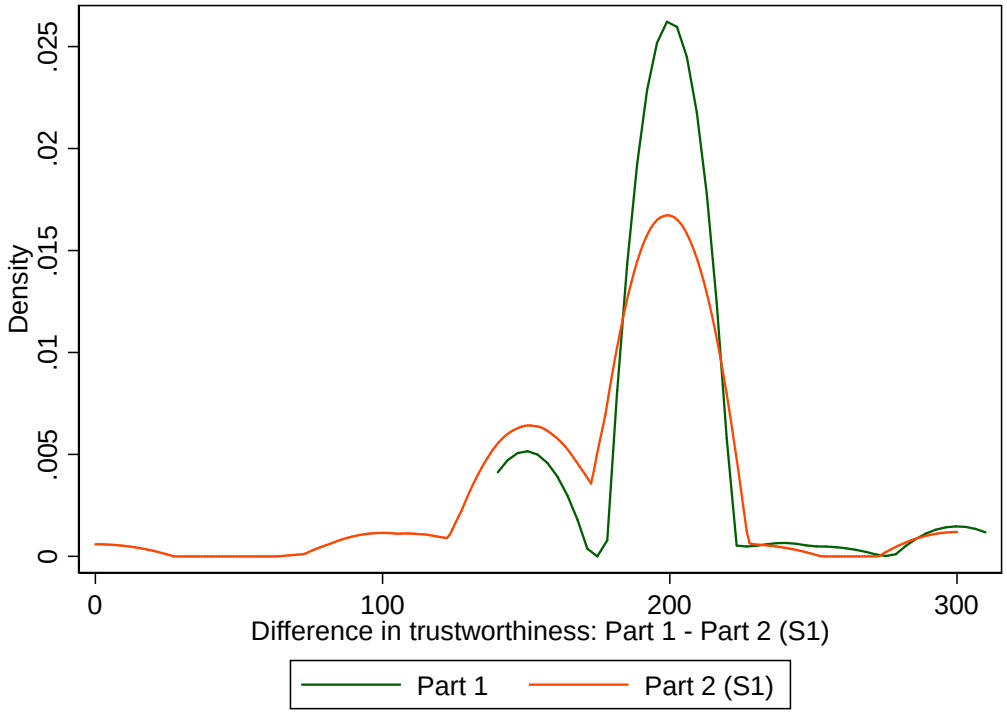
Note: the mean is reported and the standard deviation between parentheses.

Comparing the amount returned in both parts for the high trustworthiness group (see Table 7) we find that they return a smaller amount in the second part: 197.93 vs 183.14 (paired t-test, $p = 0.0003$). Thus, part of the effect observed is due to the fact that in the second part, individuals are informed about the group they are in. [6] In particular, we inform them whether members of their group returned less or more than 150. That could change what they perceive to be socially acceptable, or the "social norm", and make them more likely to reduce the amount returned. Results are different for the low trustworthiness group, as subjects in the first part returned a slightly lower, but not significant amount than in the second part (45 vs. 51, $p=0.5458$). When looking at the high trustworthiness group, Figure 4 shows how the distribution of amounts returned has a higher mass of points to the left in the second round, indicating the decrease in the amount returned.

[6] Another difference between part 1 and S_1 is that subjects are playing for a second time the same game which could generate some learning (Weber, 2003). The sequence of Parts 1 and 2, motivated by our research questions, may also present some order effects. These learning and order effects are, however, present in all the treatments analyzed in this section, so at a minimum, the presence of institutions is making a difference on top of them (see Table 8).

However, knowing the group they are in may not be the whole answer. In what follows we compare results from this treatment to the rest to analyze the importance of the introduction of institutions. As we only observe the crowding out effect for the high trustworthiness group, we restrict our sample to this group. We then compare the treatment mentioned above where they play the same game in both the stages (and know their group) to the treatments where institutions are either chosen randomly, individually or collectively.

Figure 4. Distribution of amounts returned in the first and second rounds, high trustworthiness group in the *Repeated* treatment.



As in the previous section, the dependent variable is the difference in the amounts returned in the first and second parts (S1). Thus, a positive number would indicate a decrease in the amount returned in the second part, compared to the first. We first test whether the introduction of institutions further increases the crowding out effect over and above the effect of telling subjects the group they are in (i.e. compared with the difference observed in the Repeated treatment). We run regressions with a dummy called "NI+Institutions", which takes value one for NI+Purchase, NI+Voting, and NI+Random treatments where higher levels of institutions are introduced, and value 0 for the Repeated treatment. Results are shown in the first column of Table 8.

Table 8. Crowding out of civic spirit. Linear regressions on the difference between amounts returned in the first and second parts (S1) of the experiment.

	(1)	(2)
Constant	61.546***	62.154***
	(17.801)	(17.790)
NI+Institutions	11.673**	12.894**
	(4.908)	(5.733)
NI+Choice		-2.042
		(5.588)
Risk aversion	-0.233	-0.237
	(1.218)	(1.218)
Envy	3.795*	3.731*
	(2.203)	(2.257)
Compassion	-15.321***	-15.256***
	(3.530)	(3.563)
CRT	1.592	1.490
	(1.613)	(1.686)
Numeracy	-3.702**	-3.744**
	(1.533)	(1.528)
Female	-5.952	-5.952
	(4.358)	(4.362)
Age	-0.152	-0.153
	(0.183)	(0.183)
Attended college	17.086***	16.906***
	(6.011)	(6.082)
Finished college	-7.946	-7.943
	(5.487)	(5.498)
Trust unknown individuals	0.252	0.237
	(2.650)	(2.653)
Expected trustworthiness	-0.062	-0.062
(first part)	(0.060)	(0.060)
Sent in the first part	-2.104	-1.919
	(4.815)	(4.846)
Observations	516	516
R2	0.1239	0.1242

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

We find a positive and significant effect of this (difference) variable. In the second column we introduce another dummy called "NI+Choice" that indicates the treatments that introduce higher levels of institutions that are chosen, either directly (NI+Purchase) or by voting (NI+Voting). The "NI+Choice" dummy variable takes value one for NI+Purchase and, NI+Voting treatments, and value 0 for the Repeated and NI+Random treatments. We find that introducing institutions significantly increases the difference between the amount returned in the first and the second parts ($\beta(NI + Institutions) = 11.673$, $p = 0.018$), and the effect is larger than the effect of telling them the group they are in, which is the

reference category. However, once institutions are introduced, the fact that they are chosen does not have a significant effect ($\beta(NI + Choice) = -2.042, p = 0.661$).

5.5. Economic cost: Low vs High Trustworthiness group.

In this section we investigate the economic costs of being in a low trustworthiness group. In order to do this, we can take advantage of the fact that in the NI+Purchase treatment the participants had the option "Not to invest" in addition to choosing one of the four levels of institutions as in the Purchase treatment. Given that choosing any level of institutions can also increase gains for both players (see last column in Table 9), we can use this to compute the benefits of exchange lost due to lack of trust in this treatment.

Table 9. Economic costs of low trustworthiness. Proportion of individuals who choose each level of institutions by group.

Level of institutions	High trustworthiness group	Low trustworthiness group	Total rents
Not to invest	13.38%	29.41%	200
S1	52.23%	31.37%	400
S2	10.19%	5.88%	370
S3	12.74%	7.84%	320
S4	11.46%	25.49%	250
N	157	51	

We find that a smaller proportion of the high trustworthiness individuals (13.38%) decided not to invest, while this proportion was significantly larger (29.41%) in the low trustworthiness group (test of proportions, *p=0.0085*). In Table 9 we can see the proportion of individuals who chose each type of institution. If we multiply each proportion by the size of the pie given by each type of institutions, we get that while the gains from trade in the high trustworthiness group are of 341.53, while in the low trustworthiness group this is 294.12.

6. Conclusions

The importance of institutions in exchange and governance has been long appreciated. In early trade it was common to see the use of endogenously developed social networks to enforce trust and trustworthiness in exchange (Greif, 1993; Ghosh, 1993; Sealand, 2013). Evidence points out that institutions can endogenously arise out of a participative process (mutual agreements, social networks, voting, etc..) or be imposed upon through legal dictate. Interestingly, how the choice of the institutions impacts future actions of the participating

agents is little studied. The importance of understanding this link in the design of institutions cannot be understated.

In this paper we have attempted to understand the causes and consequences of institutions chosen by individuals given their level of trustworthiness. We also study how the demand for institutions depends on the level of trustworthiness and how it depends on the manner in which it is chosen: purchase or voting.

We obtain several interesting new results. We find that there is a significant demand for institutions and it depends on the level of trustworthiness of the group. When institutions are *purchased* or *voted* upon only by the senders, individuals in the low trustworthiness group demand higher levels of institutions than those in the high trustworthiness group. When *voted* upon by all individuals, the demand for institutions is the same in both groups. This is explained by the fact that low trustworthiness individuals vote strategically to take advantage of future interactions by voting for a low level of insurance.

The behavior of receivers is similar across treatments and those in the low trustworthiness group increase the amount returned as the level of institutions increases (i.e. greater insurance). However, those in the high trustworthiness group return less as the level (of institutions) increases. We find that the level of trustworthiness in the first part of the experiment is higher than in the second. This is mostly explained by the introduction of institutions, that crowd out civic behavior.

Our experiment is static, and in our context, institutions are a substitute for trust. In this way we miss a potentially important dynamic effect, where good institutions and high insurance can foster trust, create a social norm, and eventually become unnecessary. Historical research, such as Guiso, Sapienza & Zingales (2016), suggests that good institutions can enhance civic virtue in the long run. We believe that this is an important agenda for future experimental research in this context.

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